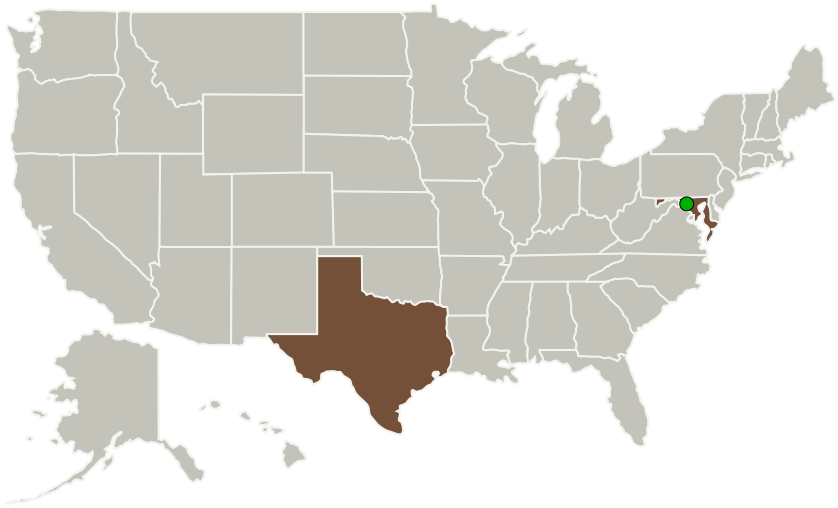
Cryogenic MEMS Technology for Sensing Applications, Phase I

Completed Technology Project (2011 - 2011)

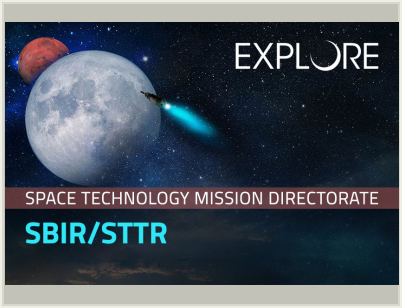
Project Introduction

The development of cryogenic microwave components, such as focal plane polarization modulators, first requires an RF MEMS switching technology that operates effectively at cryogenic temperatures. The approach of this project is to explore the performance of capacitive MEMS switching technology at low temperatures. MEMS capacitive switches represent an alternative to ohmic contact switches, where the RF impedance of the device is not dependent on metal-metal contacts. These MEMS switches operate with much lower effective series resistance (generally ~ 0.25 ohms) and do not have the issues associated with dry contact switching. This technology also has the advantage of operating very well at millimeter-wave frequencies and higher, where many of the most demanding performance limitations exist. This technology has seen significant investment through DARPA and the DOD, and is directly applicable to high-performance microwave components needed in several of the upcoming NASA missions.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
MEMtronics Corporation	Lead Organization	Industry	Plano, Texas
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland



Cryogenic MEMS Technology for Sensing Applications, Phase I

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

Cryogenic MEMS Technology for Sensing Applications, Phase I

Completed Technology Project (2011 - 2011)

Primary U.S. Work Locations	
Maryland	Texas

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Summary: Cryogenic MEMS Technology for Sensing Applications, Pha se I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/138068)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

MEMtronics Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

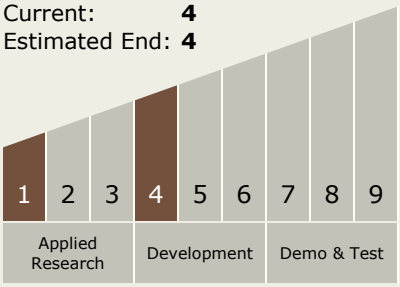
Carlos Torrez

Principal Investigator:

Chuck Goldsmith

Technology Maturity (TRL)

Start: **1**
Current: **4**
Estimated End: **4**



Cryogenic MEMS Technology for Sensing Applications, Phase I

Completed Technology Project (2011 - 2011)

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System